

LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously presented) A vector-detecting apparatus that detects an in-phase component and a quadrature-phase component of a pre-determined frequency signal, said apparatus comprising:

a first filter; and

a second filter whose impulse response is orthogonal to said first filter,

wherein an output of said first filter is regarded as the in-phase component of said pre-determined frequency signal, and output of said second filter is regarded as the quadrature-phase component of said pre-determined frequency signal,

wherein an impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal and an impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal,

wherein said first filter is a single filter that has an impulse response weighted by a sine function of the frequency of the pre-determined frequency signal and said second filter is a single filter that has an impulse response weighted by a cosine function of the frequency of the pre-determined frequency signal, and

wherein said first filter and said second filter are digital filters.

2. (Canceled)

3. (Currently amended) A vector-detecting apparatus that detects an in-phase component and a quadrature-phase component of a pre-determined frequency signal, said apparatus comprising:

a mixer frequency converter for converting said pre-determined frequency signal to a signal under test;

a first filter; and

a second filter,

wherein said first and second filters filter an output signal of said mixer frequency converter and whose impulse responses are orthogonal to each other,

wherein an output of said first filter is regarded as the in-phase component of said signal under test, and an output of said second filter is regarded as the quadrature-phase component of said signal under test,

wherein an impulse response of said first filter is weighted by a sine function of the frequency of said signal under test after frequency conversion by said mixer frequency converter, and an impulse response of said second filter is weighted by a cosine function of the frequency of the signal under test after frequency conversion by the mixer frequency converter,

wherein said first filter and said second filter are digital filters,

wherein a ratio of the frequency of said pre-determined frequency signal and said signal under test is an integer of 2 or higher, and

wherein a ratio of the frequency of a local signal inputted into said mixer frequency converter and said signal under test is an integer of 3 or higher.

4. (Canceled)

5. (Canceled)

6. (Previously presented) An impedance measuring apparatus comprising a vector-detecting apparatus, wherein said vector-detecting apparatus comprises:

a first filter and a second filter whose impulse responses are orthogonal to each other;

wherein an output of said first filter is regarded as an in-phase component of a pre-determined frequency signal, and an output of said second filter is regarded as a quadrature-phase component of said pre-determined frequency signal,

wherein the impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal and the impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal,

wherein said first filter is a single filter that has an impulse response weighted by a sine function of the frequency of the pre-determined frequency signal and said second filter is a single filter that has an impulse response weighted by a cosine function of the frequency of the pre-

determined frequency signal, and
wherein said first filter and said second filter are digital filters.

7. (Canceled)

8. (Currently amended) An impedance measuring apparatus that measures an in-phase component and a quadrature-phase component of a pre-determined frequency signal, said apparatus comprising:

a mixerfrequency converter;

a first filter; and

a second filter, wherein said first and second filters are capable of filtering an output signal of said mixer frequency converter and whose impulse responses are orthogonal to each other,

wherein an output of said first filter is regarded as the in-phase component of said pre-determined frequency signal, and an output of said second filter is regarded as the quadrature-phase component of said pre-determined frequency signal,

wherein the impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal after frequency conversion by said mixer frequency converter and the impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal after frequency conversion by said mixerfrequency converter,

wherein said first filter and said second filter are digital filters,

wherein a ratio of the frequency of said pre-determined frequency signal and said signal under test is an integer of 2 or higher, and

wherein a ratio of the frequency of a local signal inputted into said mixer frequency converter and said signal under test is an integer of 3 or higher.

9. (Canceled)

10. (Canceled)